SHARP
Safety & Health Assessment & Research for Prevention
1-888-66-SHARP

Innovations

Reporting a Year of Progress

Developing Strategies for Injury and Illness Prevention

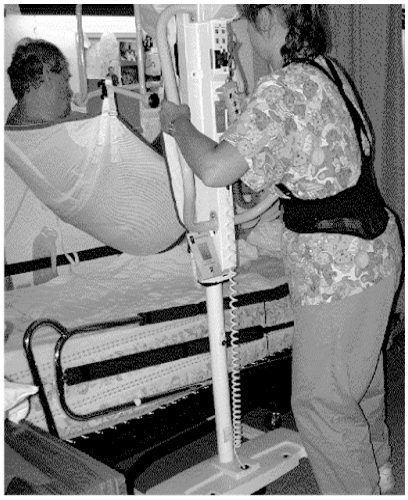
January 2001
Report 15-9-2001

Investing in Equipment Can Decrease Injuries in Nursing Homes

Can using a machine decrease the stress of lifting?

Caring for residents in nursing homes involves lifting and handling – that's not new information. What ***is*** new, however, is the availability of modern equipment to assist in these activities – equipment that is more comfortable and secure for residents, as well as easier to use and maneuver for those who use it.

Since September 1998, SHARP has been conducting a study in licensed nursing homes in Washington State. The study is called ***"Getting to Zero",*** a cooperative effort between the Department of Labor & Industries and the nursing home industry, and is funded in part by the National Institute for Occupational Safety and Health (NIOSH). The study is investigating a number of different strategies aimed at decreasing the physical risks associated with resident handling. The goal of the interventions is to lessen the number and severity of injuries sustained by workers in nursing homes. And by decreasing risks to the caregivers, we should be increasing the safety and comfort of the residents as well.



Facilities adopting a "zero-lift" philosophy strive to minimize the amount of actual lifting performed by caregivers. Acquiring appropriate equipment, then implementing its use, are both key components of what is called a "zero-lift" program. Employee involvement, training, and management commitment are also important factors affecting the success of these programs.

As part of the study, financial incentives were given to a number of nursing homes. These facilities used the funds to buy equipment and to demonstrate progress in the various components of a zero-lift program. Site visits, with interviews and observations, were done prior to the incentives and then one year later. Workers' compensation claims are being monitored by the Department of Labor & Industries. Although the study has just entered its third year, early results suggest that the financial incentive has increased the availability and use of modern lifting equipment. We are optimistic that, in turn, this will decrease risks for injury to nursing assistants, and result in fewer injuries and related claims.

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Department of LABOR AND INDUSTRIES

Healthy Workplaces: Learning from Experience

The major objective of the Healthy Workplaces Initiative is to work with management and labor in key industries to identify and share best practices in both occupational safety and health and economic performance.

The Healthy Workplaces team members contacted several industry associations and labor unions to develop cooperative relationships. Food processing, aerospace & parts, machine shops, construction, shipbuilding, health care, and other industries indicated their interest in participating in the initiative. Based on a review of several criteria and following stakeholder discussions, SHARP has chosen food processing as the initial study industry.

An extensive literature survey has been conducted that outlines the organizational, technological, individual and demographic factors which contribute to a healthy workplace. Such factors as occupational health and safety communications, management commitment, employee assistance initiatives, labor and management relations and employment patterns have been included in an employer survey which is currently being administered to approximately 450 firms in the food processing industry.

The results of the employer survey will be used to identify companies representing a broad range of management practices and health and safety outcomes. SHARP intends to conduct site visits at 36 of these companies. The site visits are crucial to identifying the technological and organizational practices that best promote health and safety as well as productivity.

Based upon the knowledge gained from the site visits, SHARP will design and evaluate interventions tailored to the needs of businesses across all segments of the food processing industry. Special attention will be paid to smaller businesses as they may not be able to implement practices that work in larger companies.

Tracking and Preventing Work-Related Skin Disorders

Frequent hand washing in health care is a necessary practice, but can cause harm.

Skin disorders are the second most frequent work-related illness reported in the United States. SHARP receives federal funding to track and develop methods to prevent work-related skin disorders in Washington State. SHARP evaluates data from workers' compensation claims and a network of reporting health care providers to describe the frequency and distribution of skin disorders in Washington State. Prevention programs are developed for industries with relatively high frequencies or risks of skin disorders.

Most recently, in the agricultural industry, many claims resulted from exposure to poison oak or ivy. To help prevent exposure, SHARP developed an educational brochure and color poster on poison oak and ivy, both in Spanish and English. The brochure was distributed to agricultural facilities and organizations. A copy of the brochure and poster may be obtained by contacting SHARP. A general educational brochure on skin health in agricultural workers is also currently under development.

"Leaves of three, let it be"

Exposure to latex gloves, soaps and detergents and frequent hand washing are common causes of skin problems in health care workers. SHARP is currently developing educational materials to help health care workers prevent these problems. This document will be distributed to hospitals, nursing homes and hospice organizations.

SHARP has worked with:

Advanced Composite Manufacturers ● Association of Washington Business ● Aluminum Industry ● American Conference of Governmental Industrial Hygienists ● American Industrial Hygiene Association ● American National Standards Institute ● American Public Health Association ● Apple Growers ● Battery Manufacturers ● California Occupational Health and Safety Administration ● U.S. Environmental Protection Agency ● Farm Workers ● Firing Ranges ● Fish Processing ● General Contractors ● Hops Growers Association ● Hops Industry ● King County Local Hazardous Waste Management Program ● Local Health Departments ● Lumber & Plywood Mills ● Machine Shops ● National Institute for Occupational Safety and Health (NIOSH) ● Northwest Association of Occupational & Environmental Medicine ● Northwest Wall & Ceiling Industry Trust Fund ● Nursing Homes ● Occupational Safety and Health Administration (OSHA) ● Ohio State University ● Poultry Processing ● Pulp and Paper Industry ● Radiator Repair ● Roofing Contractors ● Shellfish Harvesters ● Telecommunications Industry ● The Evergreen State College ● TOC Management Services ● Tree Nurseries ● U.S. Department of Labor ● U.S. Geological Survey ● United Brotherhood of Carpenters and Joiners of America ● United Food & Commercial Workers ● United Steel Workers of America ● University of Washington Northwest Center for Occupational Health and Safety ● Washington Health Care Association ● Washington State Labor Council ● Washington State Association of Occupational Health Nurses ● Washington State Department of Community, Trade and Economic Development ● Washington State Departments of Corrections, Ecology, Employment Security, Health, Revenue and Social and Health Services ● Washington State Medical Association ● Washington State Nursing Association ● Washington State University ● Western Council of Industrial Workers ● Western Wood Products Association ● WISHA Monitoring Committee ● Wood Products Industry

Exploring Specific Risk Factors and Health Problems

Developing Ergonomic Solutions in the Roofing Industry

Several thousand roofers in Washington State suffer injuries related to musculoskeletal hazards each year.

The roofing industry ranks as one of the top five industries for upper extremity and back disorders. Several thousand Washington State roofers suffer injuries related to poor working conditions each year. This results in a large negative economic impact on workers, companies, and the State of Washington. These facts helped the Roofing Contractors Association (RCA), as well as labor, be proactive in working with SHARP to identify ergonomic solutions for the industry.

Initially, all major tasks in the roofing industry were identified and categorized into either potentially high or non-high risk activities. These tasks were then observed and videotaped at roofing sites around western Washington. Potentially "hazardous" activities were identified, with the understanding that tasks and levels of risk may vary greatly between sites and employers. Possible solutions to reduce tasks below the "hazardous level" were compiled through group brainstorming, worker interviews, and questionnaires mailed to contractors.

Acceptable solutions have been identified for many of the more common roofing tasks. Ideas have stemmed from best practices already in use, solutions from other industries, and low-cost innovations. Engineering and administrative controls are better than changes in work practices. Most solutions are relatively simple and low-cost. For example, workers loading 100 pound asphalt kegs into the kettle for melting can break kegs into smaller 25-35 pound pieces, lowering the risk below the hazard level. Another control is a "zero-lift" policy for materials weighing over 90 pounds, implemented by using mechanical aids, hand-carts, dollies, or two-person lifts when mechanical aids are not feasible. Back bending during insulation installation may also be reduced by using a screw-gun extension.

Engineering and administrative controls are better than changes in work methods.

Future work will focus on developing solutions for the more common and problematic tasks. A draft report will be available to contractors and workers statewide by the summer of 2001.

Assessing Long-Term Consequences of Carpal Tunnel Syndrome (CTS)

Long-term effects of CTS can exceed the direct costs associated with the injury.

This project attempts to assess the long-term social and economic consequences of work-related carpal tunnel syndrome injuries. In measuring the cost of these injuries, it is important to look beyond the direct costs associated with workers' compensation expenses, and also consider the full set of costs borne by the worker, his/her household and the community. They include the loss of earning power a worker suffers due to continuing disability. They also include the effects on the worker's household as other members adjust to help compensate for the effects of the injury.

To gather information on these issues, SHARP conducted a survey of workers who were diagnosed with CTS and whose claims opened in 1993-1994. Comparisons on a broad range of cost indicators will be made between this group of injured workers and two control groups. SHARP predicts that six to seven years after their injury, the CTS group will be suffering substantially higher losses than either of the control groups. Preliminary results from the survey confirm this prediction. Information gained from this project will be shared with employers' associations, unions, and health and safety professionals in an effort to document the full extent of the social burden of this illness.

Check out SHARP on the World Wide Web!

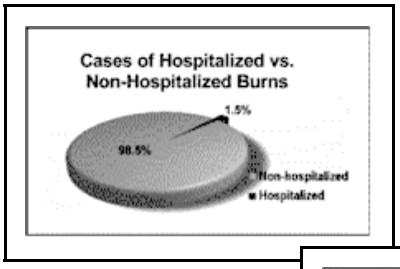
www.lni.wa.gov/sharp

SHARP's website provides more information about the SHARP program, describes SHARP's research interests, lists our publications (some available online), introduces the SHARP team, and provides links to other sites on occupational and environmental interests.

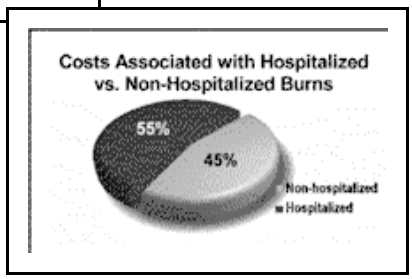
Tracking Health Conditions Related to Work

Work-Related Burns: Tracking Serious and Costly Occupational Injuries

From 1994 to 1998, burns accounted for 20,213 workers' compensation claims in Washington State. Eight of these burns were fatal. Of the total claims, 19,319 were paid by the State Fund while self-insured businesses paid the rest. A total of 288 State Fund claims (1.5%) required inpatient hospitalization.



While the majority of burns resulted from thermal exposures, chemical and electrical burns were also noted. Although there has been a general decline in the claims rate for all burns, the rate for hospitalized electrical burns increased significantly (78%) from 1994 to 1998.



For the five year period, costs incurred by State Fund burn claims totaled over $25,400,000. Although hospitalized cases accounted for only 1.5% of all State Fund burn claims, they accounted for over 55% of the costs. Furthermore, while non-hospitalized burn claims averaged three lost workdays per claim, this increased to 132 lost workdays per claim for hospitalized cases.

Workers' compensation data can be used to prioritize industries for further follow-up. For example, industries such as roofing, foundries, and aluminum smelting have relatively high rates and larger proportions of hospitalized cases, and therefore are identified as priorities for potential follow-up activities.

Work-Related Musculoskeletal Disorders (WMSDs) in Washington State, 1990-1998

Between 1990-1998, there were 392,925 State Fund accepted claims for non-traumatic soft tissue musculoskeletal disorders (WMSD) of the neck, back and upper extremity resulting in:

- $2.6 billion in direct costs, an average of $5,923 per claim.
- 20.5 million lost workdays, an average of 146 lost workdays per compensable claim.
- 43,658 State Fund WMSD claims for the neck, back & upper extremity per year.
- An average claims incidence rate (CIR) of 355 per 10,000 full-time equivalent employees (FTEs).
- An average compensable CIR of 129 per 10,000 FTEs.

Over one quarter (26.4%) of all State Fund accepted claims were WMSD claims. More than 36% of the WMSD claims were compensable (four or more lost workdays) compared to only 23.5% of all claims. Of the WMSD claims, 54.4% were for back disorders, and 34% were for upper extremity disorders.

We used the Prevention Index to identify industries with the greatest impact of WMSDs. Industries are listed in rank order by the number of claims and by the rate of claims. The Prevention Index is the average of the two ranks for each industry. An industry, therefore, is high on the Prevention Index if it has a relatively high number of claims and a relatively high claims rate. The table lists the industries by Prevention Index based on the Washington Industrial Classification Codes (risk classes), which are more precise than SIC Codes. The full report can be obtained by contacting SHARP.

Top 10 Industries for WMSDs by Prevention Index & Washington Industrial Classification (WIC)

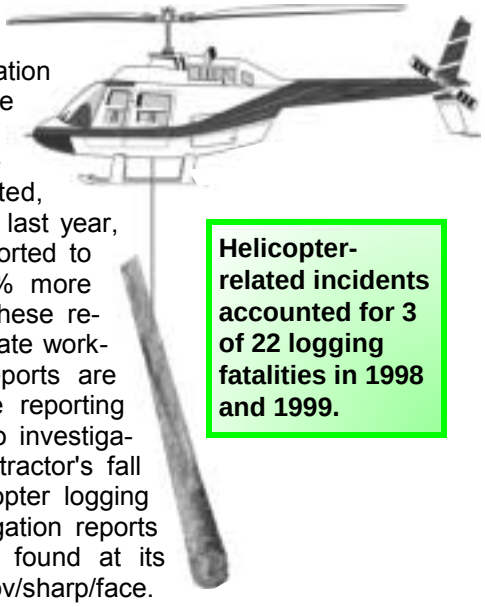
Rank	State Fund WIC	Self Insured Compensable WIC
1	Nursing Homes	Parcel Package Delivery
2	Wood Frame Building Construction	Bus Companies
3	Wood Products Manufacturing	Airlines, Ground Crew
4	Roofing	Trucking
5	Wallboard Installation	Schools, All Other Employees
6	Temporary Help-Assembly	Warehouses Not Otherwise Classified (NOC)
7	Sawmills	Cities-All Other Employees
8	Building Construction NOC	Airlines, Flight Crews
9	Garbage Collection	Temporary Help-Administrative Staff*
10	Moving Companies	Wholesale Stores

**Temp Help Administrative in Self Insured also has temporary assembly and machine operator claims*

WEBSITE
www.lni.wa.gov/sharp/face

Fatality Assessment Control Evaluation (FACE) Program

At the time of writing, 57 fatalities were reported to SHARP's Fatality Assessment and Control Evaluation (FACE) program for the year 2000. The FACE program tracks workplace fatalities in Washington that are due to acute trauma, investigates a select number of fatal incidents, and shares information about the incidents with the goal of preventing future fatalities. SHARP's FACE program is supported by a federal grant. The industries with the most fatalities were Construction (14 fatalities) and Transportation and Public Utilities (10). The most common types of incidents were motor vehicle collisions, machinery-related, and falls. At the same time last year, there were 66 fatalities reported to our program, which is 16% more than reported this year. These results most likely underestimate workplace fatalities because reports are not always received in the reporting year. FACE completed two investigation reports detailing a contractor's fall from a ladder and a helicopter logging incident. Data and investigation reports from the program can be found at its home page at www.lni.wa.gov/sharp/face.



Helicopter-related incidents accounted for 3 of 22 logging fatalities in 1998 and 1999.

Washington State's Adult Blood Lead Registry

Exposure to lead can cause serious health effects, such as damage to the brain, kidneys, and reproductive system. The SHARP program has administered Washington State's Adult Blood Lead Registry since May 1993. As of September 30, 2000, SHARP has entered approximately 41,000 blood lead reports for approximately 28,000 individuals across all industries. Over 1,000 individuals had blood lead levels greater than 25 µg/dl (the level of concern for lead in adults). However, the data underestimate the problem of elevated blood lead levels in the workplace, because there is good evidence to suggest many lead-exposed workers are not tested. Nevertheless, data from the lead registry are extremely useful in identifying industries and workplaces with potential lead exposure problems.

For example, a bridge painting project was recently recognized as a potential concern for lead overexposure. The Registry received elevated blood lead level reports for workers on the bridge painting project between July 1999 and September 30, 2000. Even though bridge worker reports comprised only 3% of the total reports received during this period, they represented approximately 50% of the elevated blood lead levels reported.

In response, SHARP developed and distributed educational materials to affected employees and contacted health care providers to ensure compliance with the medical component of the blood lead standard. Please contact SHARP to receive a copy of "How to Avoid Lead Poisoning in Bridge Repair Work – A Fact Sheet for Bridge Workers".

Program Information

Created by the Washington State Legislature in 1990, Safety & Health Assessment & Research for Prevention (**SHARP**) is a multidisciplinary research program within the Washington State Department of Labor and Industries.

SHARP's mission is to conduct research, monitoring, and demonstration projects that promote healthy work environments and prevent workplace injuries and illnesses.

SHARP's research specialists offer expertise in computer systems, epidemiology, ergonomics, industrial hygiene, occupational medicine, economics, safety and toxicology.

SHARP is available to help you address a wide range of occupational health concerns. Our staff assists workers and employers with complex health and safety issues, delivers seminars, presents research findings, provides independent scientific review of issues, and publishes information. Since 1990, SHARP has addressed a diverse range of occupational health concerns in response to requests from employers, labor, health care professionals and agency staff.

SHARP research priorities are based upon the **MUSTCURE** criteria. **M**agnitude of the problem, **U**rgency, **S**eriousness of the hazard or injury, **T**echnology transfer opportunities for prevention, **C**ost, **U**nder-reporting potential, **R**esearch gaps to fill and **E**merging hazard, disease or injury.

The collective knowledge and creativity of SHARP's research team focus on accomplishing the following **Goals:**

- **SHARP** collects and analyzes data for injury and illness prevention.
- **SHARP** tests hypotheses and develops methods for evaluating workplace exposure and health.
- **SHARP** provides information and promotes technology transfer.
- **SHARP** serves as a scientific resource.
- **SHARP** evaluates the effectiveness of intervention strategies aimed at reducing workplace injuries and illnesses.

Visit **SHARP's** website at *http://www.lni.wa.gov/sharp* for additional program information, or contact us at: SHARP, Washington State Department of Labor and Industries, PO Box 44330, Olympia, WA 98504-4330. Tel. (888)-66-SHARP (toll-free).

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Testing Methods for Identifying Risks

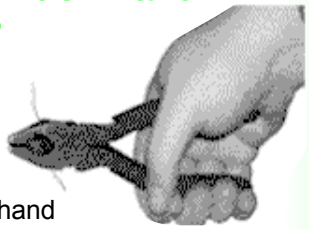
Identifying and Ranking the Most Hazardous Workplace Chemicals

The SHARP program has initiated a project to identify the most hazardous chemicals in Washington workplaces and those workers exposed to them. Several screening methods are currently being employed to identify the predominant chemicals responsible for both acute and chronic health effects. Estimates of relative risk were calculated by combining industry-specific exposure data with toxicity data and Washington State employment data. SHARP has first focused on inorganic lead and hexavalent chromium. SHARP is producing and distributing educational materials for lead- and chromium-using industries identified by this project. To date, we have conducted outreach activities to lead-exposed workers in radiator repair and steel bridge renovation.

SHARP's research specialists offer expertise in computer systems, epidemiology, ergonomics, industrial hygiene, occupational medicine, economics, safety and toxicology. Current SHARP staff:

Barbara Silverstein, MPH, PhD, CPE	*Research Director*
James Baggs, PhD	*Epidemiologist*
Stephen Bao, PhD, CPE	*Ergonomist*
Dave Bonauto, MD, MPH	*Associate Medical Director*
Randy Clark, BA	*Office Assistant Senior*
Tammi Clawson	*Administrative Assistant*
Marty Cohen, ScD, CIH	*Senior Industrial Hygienist*
Marc Leastman, BA	*IT System Specialist*
Catherine Connon, PhD QMN	*Public Health Advisor*
Christy Curwick, MPH	*Public Health Specialist*
Sharon Drozdowsky, MES	*Research Analyst*
Michael Foley, PhD (candidate)	*Economist*
Ninica Howard, MS, CPE	*Ergonomist*
John Kalat, BA	*IT System Specialist*
Christina Marino, MD, MPH	*Epidemiologist*
Hieu Pham	*Office Assistant*
Kathleen Rockefeller, PT, PhD (candidate)	*Ergonomist*
Tom Sjostrom, MS, HRMIT	*Safety Engineer*
Caroline Smith, BA	*Secretary Senior*
Peregrin Spielholz, PhD, CPE, CSP	*Ergonomist*
Steve Whittaker, PhD	*Toxicologist*

Do you know how much hand force you applied?



We apply hand force frequently in our daily activities, for example, using pliers and opening lids of jars. Frequent excessive hand force may cause injuries to the hand and arm. Ergonomic research suggests that hand force should be kept below certain levels. However, how do we know how much hand force we are applying on the tasks we are doing? Researchers can use sophisticated hand dynamometers to estimate the hand force, but for most people the measurement equipment may not be easily available. Could there be simpler ways to estimate hand force without the use of sophisticated equipment? SHARP researchers recently did a study to answer this question.

How do you measure hand force?

Comparing the hand force you use at your job with some activities for which the force level is already known may help you to determine whether those tasks require you to apply excessive force. For example: (1) most people apply about 4.4 pound pinch grip force when operating a paper staple remover, (2) lifting a half ream of copy paper with a pinch grip requires about 5.5 pounds, (3) operating a wire cutter to cut a wire (paper clip) with a power grip requires about 14 pounds, and (4) a 20 pound grip force is usually applied when lifting a 10 pound dumbbell. This method is the so-called force matching method. SHARP researchers have found that the accuracy of the force matching method is somewhat consistent at a group level. In other words, if several people do the test and agree that the hand force of operating a machine is similar to a known force activity, it could be almost certain that the forces are almost equal. In this study, SHARP researchers also tested muscle responses while performing these activities. Details can be found in a technical report titled "Grip Strength and Hand Force Estimation" at SHARP's web site, or call SHARP for a copy of this report.